

Technology Deployment Initiatives and Partnership Program

Request for Funding FY 2005

FHWA Strategic Goal Area(s): Productivity

Focus Technology: Design Visualization

Project Title: Evaluate and incorporate design visualization techniques for project delivery

Problem Statement: The Western Federal Lands Highway Division (WFLHD) is in cooperation with Glacier National Park (GNP) in planning, designing and administrating the Going-to-the-Sun Road (GTSR) rehabilitation projects. The projects encompass five major areas. They are road rehabilitation, visitor use and experience improvements, information, information technology improvements, and transit elements.

GNP is located in Northwestern Montana, adjacent to the Canadian border. GTSR provides unique opportunities for visitors to access spectacular scenery in high alpine environments via the Going-to-the-Sun Road (GTSR), one of only two roads in the United States that is designated a National Historic Landmark. Nearly 2 million visitors visit GNP each year with a vast majority of visitors accessing the road via private automobiles.

The April 2003 GTSR Environmental Impact Statement (EIS) and subsequent Record of Decision selected a direction for rehabilitation. This included implementation of a transit system and an integrated deployment of Intelligent Transportation System (ITS) functions to support the construction, transit system, available alternate route and traveler related park information, as well as associated comfort stations, shelters, benches, and signage. The Transit Center is an integral hub for the mitigation activities and an essential component of the overarching Federal Highways-funded project (estimated \$180 Million Dollars in construction over the next 10 years).

This project is to aid the design of a major transit stop, referred to as the “Loop”, which is located near Milepost 23.5 of Going to the Sun Road. Park staff and FHA have selected the location for the site and have done preliminary site work including detailed topographic surveys, archeological and vegetations surveys, and geotechnical borings and analysis.

The proposed redevelopment of the Loop site would include reconfiguration of the parking to improve safety, pedestrian crossing, installation of new historical viewing and interpretive areas, formalize existing pedestrian overlook, construction comfort station, and transit stops for shuttle buses within the existing ground disturbance. The conceptual designs and layouts would require reviews from various disciplines involved in the project, and the State Historical Preservation Office.

Proposal: Establish a design visualization infrastructure, process, and methodology to enable various agencies to visualize conceptual, proposed, and finalized solutions. This would be accomplished by utilizing computer-generated 3-D design visualization images, modeling, and/or virtual simulations. FLHD currently uses Bentley’s MicroStation V.8 and GEOPAK Civil Engineering Suite as its core graphics program and civil design solution, each has the capacity to

generate basic conceptual 3-D images, models, and virtual simulations. In addition, sophisticated third party applications will be employed to produce photo realistic images, modeling, and virtual simulations. Additional skills and expertise in related tools and methodologies as applied to engineering project team interaction may be contracted as identified. The resulting design visualization workflow, process, and methodology will be documented to develop a training format to properly train the key participants within this process.

To facilitate ideas and seek agreements at the various milestones to achieve the final site development proposal(s), FLH will fully utilize the visualization medium to communicate ideas between landscape architects, cultural resource specialists, engineers and State officials. The project development process for GTSR currently uses the standard 2-D drawings to simulate design concepts. Currently, the representation of 2-D data has limitations in assisting the stakeholders' ability to visualize the milestones due to the long and narrow switchback with two levels of parking areas. 3-D design visualization models will bridge these limitations in all phases of the design, public involvement, and construction processes.

Benefits: With the help of 3-D design visualization, all agencies will be able to better identify all of the aspects of the design proposals by visualizing the potential impacts and formulating possible construction sequences that could reduce impacts to the lands and visitor experiences. This will enhance the project workflow processes and methodologies by shortening the time to major milestones. This will be realized as a result of improved stakeholder understanding, collaboration, communication, and effective decision-making through the use of virtual visualization applications. The design visualizations will also help the highway engineers and technical disciplines realize any potential engineering conflicts in their effort to finalize the chosen design scheme.

<u>Resources/Cost:</u>	FY 2005	Design Visualization Infrastructure	\$100,000
	FY 2006	Design Visualization for GTSR	\$100,000
	<i>TOTAL:</i>		\$200,000

Duration: March 2005-October 2006

Organization/Method: The infrastructure, process, and mechanism for generating design visualization will be defined, tested, and deployed by FLH resources and contracted resources. This design visualization proof of concept for the Loop will be funded by Technology Deployment funds. Additional sites and design visualizations models and imagery will be generated by utilizing the project funds.

Submitter:

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